

APPENDIX

Claims 15, 17, 20, 21 and 28 are cancelled. New claims 36 and 37 are added. Remaining claims are amended as follows:

20. (Amended) The method of claim [17] 37, wherein the oligomers independently comprise subunits selected from the group consisting of deoxyribonucleotides, ribonucleotides, and analogs of deoxyribonucleotides or ribonucleotides; and any single oligomer comprises one or a combination of two or more of said different types of subunits.
21. (Amended) The method of claim [17] 37 wherein each of said oligomers forming said content addressable memory matrix  $T_{ij}$  comprises, in order from the 5' end to the 3' end, (a) an oligomer strand comprising a nucleotide sequence representing an  $i$ -th component of  $V$  selected from the group consisting of  $E_i$  and  $\underline{E}_i$  for  $i = 1$  to  $i = m$ , (b) an oligomer strand comprising a nucleotide sequence representing a  $j$ -th component of  $V$  selected from the group consisting of  $E_j$  and  $\underline{E}_j$  for  $j = 1$  to  $j = m$ , wherein  $j \neq i$ , and (c) a nucleotide sequence  $F$  that is not complementary to any sequence  $E_i$  or  $\underline{E}_i$  for  $i = 1$  to  $i = m$ .
22. (Amended) The method of claim [17] 37 wherein said single-stranded oligomers comprising a complete, substoichiometric set of  $E_i$  of step (c) and  $\underline{E}_i$  are anchored to a solid support.
27. (Thrice amended) The method of claim [11] 9 wherein said operation of matrix or vector algebra is determining the inner product of two vectors  $V$  and  $W$ , and said method comprises:
- (i) obtaining for each vector  $V$  and  $W$ , sets of single-stranded oligomers  $E_i$  and  $\underline{E}_i$  representing the components of the vector, wherein the concentrations of the oligomers  $E_i$  and  $\underline{E}_i$  are proportional to the absolute values of the amplitudes of the components they represent; and

also obtaining a set of single-stranded oligomers  $E_i$  and  $\bar{E}_i$  representing the components of vector  $\underline{W}$  that are complementary to said oligomers representing vector  $\underline{W}$ , wherein the relative concentrations of the oligomers representing  $\underline{W}$  are proportional to the concentrations of their complementary oligomers in  $\underline{W}$ ,

wherein the nucleotide sequences of oligomers that represent the components of said vectors  $\underline{V}$ ,  $\underline{W}$ , and  $\underline{W}$  have minimal overlap with the nucleotide sequences of the oligomers representing the other components of said vectors];

(ii) combining samples of the oligomers representing vector  $\underline{V}$  with samples of the oligomers representing vectors  $\underline{W}$  and  $\underline{W}$  in separate respective first and second reaction mixtures and measuring [the]  $R_+$  and  $R_-$  rates of hybridization [of said] associated with the respective first and second mixtures, and obtaining a numerical value proportional to the inner product of the two vectors from [said] a difference between said  $R_+$  and  $R_-$  rates of hybridization.